

**IN THE CLAIMS**

What is claimed is:

1. A nuclear camera detector housing assembly, comprising:  
an internal housing including:
  - 5 a pair of side panels;
  - a front panel interconnecting the pair of side panels;
  - a rear panel interconnecting the pair of side panels; and
  - a top panel operatively associated with the pair of side panels, the  
front panel and the rear panel, wherein the panels are configured and adapted to  
10 shield radiation, and wherein at least one of the panels is independent of the  
remaining panels;
  - an external housing including a multiplicity of walls for supporting the  
internal housing; and
  - at least one detector disposed within the internal housing for detecting  
15 radiation energy incident thereon.
2. The nuclear camera detector housing assembly of claim 1, wherein  
the external housing comprises:
  - a pair of side walls;
  - 20 a front wall operatively connectable to the pair of side walls;
  - a rear wall operatively connectable to the pair of side walls; and
  - a top wall operatively connectable to the pair of side walls and the front  
wall, wherein the walls of the external housing support respective panels of the  
internal housing.
- 25 3. The nuclear camera detector housing assembly of claim 2, wherein  
at least one of the walls of the external housing is independent of the remaining  
walls.

4. The nuclear camera detector housing assembly of claim 1, wherein each panel of the internal housing is mechanically fastenable to a respective wall of the external housing.

5 5. The nuclear camera detector housing assembly of claim 1, wherein each panel of the internal housing are connected to a respective wall of the external housing by at least one fastener.

10 6. The nuclear camera detector housing assembly of claim 1, wherein each panel of the internal housing is adhered to a respective wall of the external housing.

15 7. The nuclear camera detector housing assembly of claim 1, wherein each side wall panel includes a pair of opposed side terminal edges configured and adapted to sealingly engage with side terminal edges of at least one of the front panel and the rear panel.

20 8. The nuclear camera detector housing assembly of claim 7, wherein the sealing engagement is created by a labyrinth seal formed along each side terminal edge.

25 9. The nuclear camera detector housing assembly of claim 1, wherein at least one of the panels is constructed from lead, tungsten, tungsten carbide, tantalum, depleted uranium and aluminum.

30 10. A nuclear camera detector housing assembly, comprising:  
an external housing including a multiplicity of walls; and  
an internal housing nestable within the outer housing and configured and adapted to provide shielding from radiation, the internal housing including:  
a pair of side panels securable to a respective wall of the outer housing;

a front panel operatively connectable with the pair of side panels and securable to a respective wall of the outer housing;

a rear panel operatively connectable with the pair of side panels and securable to a respective wall of the outer housing; and

5 a top panel operatively connectable with the pair of side panels and the front panel and securable to a respective wall of the outer housing.

11. The nuclear camera detector housing assembly of claim 10, wherein the external housing comprises:

10 a pair of side walls;  
a front wall operatively connectable between the pair of side walls; and  
a rear wall operatively connectable between the pair of side walls.

12. The nuclear camera detector housing assembly of claim 10,  
15 wherein at least one of the panels of the internal housing is fabricated from at least one of lead, tungsten, tungsten carbide, tantalum, depleted uranium and aluminum.

13. The nuclear camera detector housing assembly of claim 10,  
20 wherein each panel of the internal housing is mechanically fastenable to a respective wall of the outer housing.

14. The nuclear camera detector housing assembly of claim 13,  
wherein each panel of the internal housing is connected to a respective wall of  
25 the external housing by at least one fastener.

15. The nuclear camera detector housing assembly of claim 13,  
wherein the walls of the external housing are connected to one another by at least one fastener.

16. The nuclear camera detector housing assembly of claim 15, wherein the top wall and the top panel include at least one aperture formed therein and in registration with one another.

5           17. The nuclear camera detector housing assembly of claim 16, wherein each of the pair of side panels, the front panel and the rear panel includes a flange extending from an upper terminal edge thereof.

10           18. The nuclear camera detector housing assembly of claim 17, wherein each flange has a height which is substantially equal to a thickness of the top panel.

15           19. The nuclear camera detector housing assembly of claim 10, further comprising at least one detector disposed within the internal housing for detecting radiation energy incident thereon.

20           20. The nuclear camera detector housing assembly of claim 19, wherein each detector is a solid state detector module.

20           21. The nuclear camera detector housing assembly of claim 20, wherein each detector is composed of at least one of cadmium telluride and zinc telluride.

25           22. A method of constructing a nuclear camera detector housing, comprising the steps of:  
            providing a nuclear camera detector housing including:  
                an internal housing including:  
                    a pair of side panels;  
                    a front panel interconnecting the pair of side panels;  
30              a rear panel interconnecting the pair of side panels; and

a top panel operatively associated with the pair of side panels, the front panel and the rear panel, wherein the panels are configured and adapted to shield radiation, and wherein at least one of the panels is independent of the remaining panels;

5                    an external housing including a multiplicity of walls for supporting the internal housing; and

                    at least one detector disposed within the internal housing for detecting radiation energy incident thereon;

                    securing the top, front, back and side panels of the inner housing to  
10    respective top, front, back and side walls of the outer housing;

                    securing the front, back and side walls of the external housing to one another;

                    placing the top wall of the external housing atop an upper edge of the front, back and side walls of the external housing; and

15                    securing the top wall of the external housing to the upper edge of the front, back and side walls of the external housing.

23.    The method according to claim 22, wherein each of the panels is made of at least one of lead, tungsten, tungsten carbide, tantalum, depleted  
20    uranium and aluminum.

24.    The method according to claim 23, wherein the adjacent terminal edges of the front, rear and side shielding panels are provided with labyrinth  
25    seals.

25.    The method according to claim 23, wherein the nuclear camera detector housing includes a plurality of mechanical fasteners, and wherein the step of securing the top, front, back and side panels of the inner housing to  
30    respective top, front, back and side walls of the outer housing includes mechanically fastening the top, front, back and side panels of the inner housing to respective top, front, back and side walls of the outer housing.

26. The method according to claim 25, wherein the mechanical fasteners are screws.

5        27. The method according to claim 23, wherein at least one of the panels of the internal housing is manufactured by machining.